

**ABSTRACT**

An energy-efficient heat pump water heating system determines whether to energize a heat pump by interpreting readings from one or more temperature sensors based on two thresholds. The heat pump is energized if the detected temperature falls below a first threshold and de-energized when the detected temperature rises above a second threshold. The thresholds may correspond to outputs of two or more sensors. Using multiple temperature thresholds improves the temperature sensing capabilities of the system, thereby improving energy efficiency by matching heat pump operation with hot water demand more closely than previously known systems.

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